

Application No.: 10/040,917

Attorney Docket No.: 59589.000040

REMARKS

Claims 1-15, 17-20, 22, 23 and 25-42 are pending in this application. Claims 32 -37 have been withdrawn from consideration.

By this Amendment, claims 1, 12, 31, 38 and 39 are amended. Applicants have amended the claims to more particularly point out various features of the present invention.

No new matter is presented by the Amendment. Support for the amendments may be found, for example, in paragraphs 45 and 46.

Applicants respectfully request reconsideration of the application.

A. The 35 U.S.C. § 112, Second Paragraph Rejection

The Office Action rejects claim 12 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Office Action asserts deficiencies with the claim. In response, the dependency of claim 12 has been amended, as suggested by the Examiner. It is respectfully submitted that the claims now satisfy all requirements of 35 U.S.C. §112.

B. The Claims Recite Patentable Subject Matter over the Applied Art

1. The 35 U.S.C. §102 Rejection Based on Yokota

In the Office Action, claims 1, 2, 7, 9-15, 17-20, 22, 23, 25-30 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Yokota et al (USP 6,254,749). This rejection is respectfully traversed.

The features of claim 1 are set forth above, in the claims listing. Claim 1 is directed to a gas sensor system for monitoring gas concentrations in flue gas generated by a combustor. Claim 1 recites various features including an outer shell, a solid electrolyte cell disposed within the outer shell, a first electrode, a second electrode and a processing portion. Further, claim 1

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has been amended to recite wherein the first electrode and the second electrode are configured to have different time constants resulting in a measured potential between the first electrode and the second electrode, the processing portion configured to analyze the measured potential to represent the fluctuating AC component. Applicant respectfully submits that Yokota fails to teach or suggest the features set forth in claim 1.

Applicant notes the Office Action at paragraph 17. The Office Action asserts that with respect to the first and second electrodes having different associated time constants, this would read on differences in the amount of porous material placed over each electrode (see paragraph 0045 of the specification). The Office Action further asserts that in view of this, the embodiment of Fig. 6 would thereby meet this limitation (See col. 10, lines 51-61). The Office Action further reflects that with respect to utilizing the equations of claim 38 for calculating the time constant, calculating the time constant using the specified equation is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

Yokota is directed to a carbon monoxide gas sensor and measuring device. In the referenced column 10, lines 51-61, Yokota teaches that FIG. 6 of Yokota shows an embodiment in which a gas diffusion regulating layer 18 is mounted on a surface of the CO measurement sensing electrode 13 in the embodiment shown in FIG. 2. Yokota further describes the gas diffusion regulating layer 18 is a gas diffusion regulating layer for suppressing the diffusion contact of a flammable gas other than CO gas, for example, a flammable gas having high molecular weight such as hydrocarbon, such as propane or butane to the surface of the sensing electrode 13. By providing such a gas diffusion regulating layer 18, Yokota describes it is possible to enhance the selectivity of CO gas in the sensor according to the present invention.

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More specifically, a zeolite film or the like is used. In a method of producing this, the material is laminated and formed on the surface of the sensing electrode 13 by a method such as dipping, or it is possible to form the layer by a method such as sputtering or screen printing after the sensing electrode 13 has been formed on the solid electrolyte base 11.

However, such features fail to teach or suggest all the features of claim 1, and in particular, the features of claim 1 relating to the first electrode and the second electrode having different time constants resulting in a measured potential between the first electrode and the second electrode, the processing portion configured to analyze the measured potential to represent the fluctuating AC component.

That is, Applicant submits that claim 1 recites a particular interrelationship that the different time constants (of the first and second electrodes) result in a measured potential, and that the processing portion is configured to analyze such measured potential to represent the AC component. Yokota fails to teach such interrelationship and such processing. Further, Applicant respectfully submits that such claimed features are not merely "intended use." Claim 1 clearly sets forth that the processing portion is configured to analyze such measured potential, and make a determination based thereon.

Withdrawal of the 35 U.S.C. §102 rejection based on Yokota is respectfully requested.

2. The 35 U.S.C. §103 Rejection Based on Reber and Kimura

In the Office Action, at paragraph 19, claims 1-10, 15, 17, 18, 20, 22, 23, 25-30 and 38 are rejected under 35 U.S.C. 103 as being unpatentable over Reber (USP 4,944,861) in view of Kimura et al (Principles and Development of a Thick-Film Zirconium Oxide Oxygen Sensor, pp. 101-120, from ACS Symposium Series 309, 1986). This rejection is respectfully traversed.

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The teachings of Reber and Kimura were discussed in the December 15, 2004 Office Action Response. In the current Office Action, Applicant notes in particular paragraph 32. Therein, the Office Action asserts with respect to the first and second electrodes having different associated time constants, this would read on differences in the amount of porous material placed over each electrode (see paragraph 0045 of the specification), and that however, it is notoriously old in the art to coat an electrode in an exhaust gas space with a protective layer to prevent premature failure of the electrodes. The Office Action further asserts it is unnecessary to coat the reference electrode because it is not exposed to a harsh gas environment; and in particular, this is demonstrated by Kimura where the measuring electrode is coated with a protective layer while the reference electrode is not (fig. 1,2, 7, and 8).

The Office Action reflects that Kimura further goes on to disclose that each of the electrodes has a differing response to exhaust gas; and references tables 1 and 11, asserting the measuring electrode and reference electrodes are governed by different equations. The Office Action explains that in particular, the measuring electrode is a function of diffusion coefficient for the protective layer where the reference electrode is not.

The Office Action concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was being made for Reber to include a porous protective layer to the measuring electrode (as taught by Kimura) in order to avoid premature failure of the measuring electrode. The Office Action asserts the use of a porous protective layer would result in a different associated time constant for each electrode, and reflects namely it would take gas molecules longer to get to the measuring electrode than to the reference electrode.

Applicant submits that this applied art to Reber and Kimura also fails to teach or suggest the claimed invention. That is, it is submitted that even if it were obvious to combine the applied

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art as proposed, which it is not admitted to be obvious, such modified Reber would still fail to teach or suggest the particulars of claim 1. That is, such modified Reber would fail to teach or suggest claim 1's features that the different time constants (of the first and second electrodes) result in a measured potential, and that the processing portion is configured to analyze such measured potential to represent the AC component.

Withdrawal of the 35 U.S.C. §103 rejection based on Reber and Kimura is respectfully requested.

3. The Teachings of Dietz fail to Cure the Deficiencies

In the Office Action at paragraph 33, claims 1-10, 15, 17, 18, 20, 22, 23, 25-30 and 38 in the alternative are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber in view of Kimura and Dietz et al (USP 4,419,190). Further, at paragraph 35, the Office Action asserts that claims 1, 2, 7, 9-15, 17-20, 22, 23, 25-30 and 38 in the alternative are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota in view of Dietz.

The Office Action proposes to further modify the applied art based on Dietz. The Office Action asserts Dietz teaches in an alternate oxygen sensor that a gas sensor can be provided with a waveform that is a combination of a DC voltage and an AC voltage and the two components can each be analyzed. The Office Action reflects the DC portion is utilized to determine the oxygen concentration while the AC portion is utilized to determine the temperature of the sensor. In conclusion, the Office Action explains this thereby reads on the intended function of the processing portion; and that it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Dietz for the sensor system of Reber and Kimura so that the temperature of the gas sensor can be directly measured.

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However, as can be appreciated, even if it were obvious to somehow combine the applied art as proposed, which it is not admitted to be obvious, such modification would still fail to teach or suggest the particulars of claim 1. That is, such modified art would fail to teach or suggest claim 1's features that the different time constants (of the first and second electrodes) result in a measured potential, and that the processing portion is configured to analyze such measured potential to represent the AC component.

Withdrawal of the 35 U.S.C. §103 rejections based on the further teachings of Dietz is respectfully requested.

4. The Further 35 U.S.C. §103 Rejections

The Office Action sets forth various further 35 U.S.C. §103 rejections.

That is, in paragraph 40, the Office Action asserts that claims 11-14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber in view of Kimura (with or without Dietz) in further view of Yokota. In paragraph 44, claims 31, 39 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber in view of Kimura (with or without Dietz) and Maeda (USP 4,828,673). In paragraph 48, claims 31, 39 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota (with or without Dietz) and Maeda (USP 4,828,673). In paragraph 52, claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reber and Kimura (with or without Dietz) in further view of EP 0 120423 A1. In paragraph 54, claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota (with or without Dietz) in view of EP 0 120423 A1. In paragraph 56, claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota and Maeda (with or without Dietz) in view of EP 0 120423 A1. Further, in paragraph 58, claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reber, Kimura and Maeda (with or without Dietz) in further view of EP 0 120423 A1.

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In the above rejections, the Office Action proposes to modify the applied art in various respects so as to allegedly teach the claimed invention. However, Applicant submits that such proposed modifications of the applied art even if obvious, which it is not so admitted, would fail to cure the deficiencies of the applied art, as discussed above.

In view of the comments above, Applicant respectfully requests withdrawal of the various 35 U.S.C. §103 rejections.

5. The Claims Define Patentable Subject Matter

Accordingly, Applicant respectfully submits that the applied art, either alone or in combination, fails to teach or suggest the invention as recited in claim 1. Further, Applicant respectfully submits that claim 31 recites patentable subject matter for reasons similar to those set forth above with respect to claim 1. Further, the various dependent claims recite patentable subject matter at least for their various dependency on claim 1 or claim 31, as well as for the additional subject matter such claims recite.

For example, claims 38 and 39 recite novel features. As noted above, at paragraph 17, the Office Action asserts that with respect to utilizing the equations of claim 38 for calculating the time constant, calculating the time constant using the specified equation is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. Claim 38 is hereby amended to more positively recite the processing by the processing portion using the recited relationship. Claim 39 has also been amended. It is submitted that claims 38 and 39 recite patentable subject matter.

C. Conclusion

In view of the foregoing amendments and arguments, Applicants respectfully submit that this application is now in condition for allowance. If the Examiner believes that prosecution and

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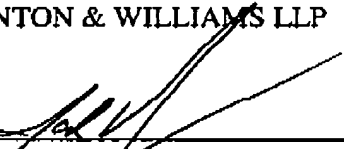
allowance of the application will be expedited through an interview, whether personal or telephonic, the Examiner is invited to telephone the undersigned with any suggestions leading to favorable disposition of the application.

No fees are believed to be due with this filing, but if any fees are due, the Commissioner is hereby authorized to charge such fees to the undersigned's Deposit Account No. 50-0206.

Respectfully submitted,

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